Curriculum Vitae

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Short Research Statement. Modern machine learning (ML) problems are combinatorial and non-convex, specially those involving latent variables, for which theoretical guarantees are quite limited. Furthermore, while *quantitative* guarantees (e.g., small test error) have been studied, *qualitative* guarantees (e.g., outlier robustness) are mostly lacking. My long-term research goal is to uncover the *general* foundations of ML and optimization that drives the empirical success across many *specific* combinatorial and non-convex ML problems. I aim to develop a set of optimization-theoretic frameworks and tools to bridge the aforementioned gaps, to further our understanding of continuous (possibly non-convex) relaxations of combinatorial problems, as well as our knowledge of non-convexity.

My aim is to generate correct, computationally efficient and statistically efficient algorithms for high dimensional ML problems. My research group has produced breakthroughs not only on classical worst-case NP-hard problems, such as learning and inference in structured prediction, community detection and learning Bayesian networks, but also on areas of recent interest such as fairness, meta learning, federated learning and robustness.

Hands-On Learning Theory (HOLT). Each Fall semester (in addition to my teaching duties) I teach a highly-selective course that mixes lectures, seminars and research. HOLT teaches how to prove theorems in learning theory. While typical courses make students work on projects for which the answer is known, HOLT encourages students to work in projects for which there is not a known answer. HOLT requires careful involvement in the project selection, and several meetings (outside the lecture times) in order to bring the projects to a level that is ready for conference submission (with some few extra work after the semester ends). Each year a small group of students go through this learning process. HOLT has already produced 20 papers accepted in top conferences and 6 papers under submission.

1 Positions

- Senior Lecturer (equivalent to Associate Professor in USA), School of Computing and Information Systems, The University of Melbourne, Australia. January 2024 – present.
- Adjunct Professor, Department of Statistics, Purdue University, West Lafayette, IN. October 2024 – present.
- Adjunct Professor, Department of Computer Science, Purdue University, West Lafayette, IN. June 2023 – present.
- Assistant Professor, Department of Computer Science, Purdue University, West Lafayette, IN. August 2015 – May 2023.
- Visiting Professor, Department of Electrical and Computer Engineering, National University of Singapore. September 2022 – October 2022.
- Postdoctoral Associate, Computer Science and Artificial Intelligence Lab (working with Tommi Jaakkola), Massachusetts Institute of Technology, Cambridge, MA. November 2012 – August 2015.
- Research Assistant, Image Analysis Lab, Stony Brook University (SUNY Stony Brook) and Brookhaven National Laboratory, New York. September 2006 – August 2012.
- Visiting Student, Medical Imaging and Computer Vision Group, Applied Mathematics Department, Ecole Centrale Paris, Paris/France. September – November 2008
- Systems Analyst, Luz del Sur, Lima/Peru. July 1998 – January 2003.
- Systems Programmer, Union de Cervecerias Peruanas Backus & Johnston, Lima/Peru. April 1997 – January 1998.

2 Education

- Ph.D. in Computer Science (advisor: Dimitris Samaras, co-advisor: Luis Ortiz), Stony Brook University (SUNY Stony Brook), New York. September 2006 – August 2012.
- M.S. in Computer Science, The George Washington University, Washington DC. September 2004 – August 2006.
- B.Sc. in Systems Engineering, Universidad de Lima, Peru, April 1993 – July 1997.

3 Publications

* indicates primary author, ^{U} and ^{G} indicate authors who were undergraduate and graduate students respectively *at the time of writing.*

Under Submission

1. Lee H.*, Mazumder R., Song Q., Honorio J., "Matrix Completion from General Deterministic Sampling Patterns," Available at Arxiv.
2. Barik A.*, Sra S., Honorio J., "Invex Programs: First Order Algorithms and Their Convergence," Available at Arxiv.
3. Maurya D.*^{G}, Honorio J., "Minimax Optimal Rates For Robust GLMs Against Constant Proportion of Identifiable Outliers."
4. Maurya D.*^{G}, Honorio J., "On the True Geometry and Sample Complexity of Outlier-Robust Sparse Precision Matrix Estimation."
5. Barik A.*, Honorio J., "Outlier-Robust Estimation of a Sparse Linear Model Using Invexity," Available at Arxiv.
6. Banerjee I.*, Honorio J., "Meta Sparse Principal Component Analysis," Available at Arxiv.
7. Ke C.*, Honorio J., "Exact Inference with Latent Variables in an Arbitrary Domain," Available at Arxiv.

Refereed Conference Proceedings

8. Ke C.*, Maurya D.^{G}, Honorio J. Partial Inference in Structured Prediction. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2025.
9. Maurya D.*^{G}, Barik A., Honorio J. On Exact Solutions of the Inner Optimization Problem of Adversarial Robustness. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2025.
10. Chaitanya M.*^{G}, Barik A., Honorio J. An SDP Formulation for Minimizing p-th Order Controversy with Unknown Initial Opinions. In *Complex Networks and Their Applications*, 2024.
11. Lee H.*, Song Q., Honorio J. Support Recovery in Sparse PCA with General Missing Data. In *Uncertainty in Artificial Intelligence (UAI)*, 2024. **(long talk, 3.8% acceptance ratio for presentations, 27% acceptance ratio for full papers).**
12. Malik V.*^{G}, Bello K., Ghoshal A., Honorio J. Identifying Causal Changes Between Linear Structural Equation Models. In *Uncertainty in Artificial Intelligence (UAI)*, 2024. **(27% acceptance ratio for full papers).**
13. Li W.*^{G}, Honorio J., Song Q. Personalized Federated $\mathcal{X}$-Armed Bandit. In *Artificial Intelligence and Statistics (AIStats)*, 2024. **(27.6% acceptance ratio for full papers).**
14. Li W.*^{G}, Song Q., Honorio J., Lin G. Federated $\mathcal{X}$-Armed Bandit. In *Association for the Advancement of Artificial Intelligence Conference (AAAI)*, 2024. **(23.8% acceptance ratio for full papers).**

15. Ke C.*[G], Honorio J. Exact Inference in High-order Structured Prediction. In *International Conference on Machine Learning (ICML)*, 2023. **(27.9% acceptance ratio for full papers).**

16. Xu Q.*[G], Tao G., Honorio J., Liu Y., An S., Shen G., Cheng S., Zhang X. Remove Model Backdoors via Importance Driven Cloning. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023. **(25.8% acceptance ratio for full papers).**

17. Barik A.*[G], Honorio J. Provable Computational and Statistical Guarantees for Efficient Learning of Continuous-Action Graphical Games. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2023.

18. Lee H.*[G], Song Q., Honorio J. Support Recovery in Sparse PCA with Incomplete Data. In *Neural Information Processing Systems (NeurIPS)*, 2022. **(25.6% acceptance ratio for full papers).**

19. Barik A.*[G], Honorio J. Sparse Mixed Linear Regression with Guarantees: Taming an Intractable Problem with Invex Relaxation. In *International Conference on Machine Learning (ICML)*, 2022. **(19.8% acceptance ratio for full papers).**

20. Li W.*[G], Barik A.[G], Honorio J. A Simple Unified Framework for High Dimensional Bandit Problems. In *International Conference on Machine Learning (ICML)*, 2022. **(19.8% acceptance ratio for full papers).**

21. Lee H.*[G], Bello K., Honorio J. On the Fundamental Limits of Exact Inference in Structured Prediction. In *IEEE International Symposium on Information Theory (ISIT)*, 2022.

22. Ke C.*[G], Honorio J. Exact Partitioning of High-order Planted Models with a Tensor Nuclear Norm Constraint. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2022.

23. Barik A.*[G], Honorio J. Provable Sample Complexity Guarantees for Learning of Continuous-Action Graphical Games with Nonparametric Utilities. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2022.

24. Barik A.*[G], Honorio J. Information Theoretic Limits for Standard and One-Bit Compressed Sensing with Graph-Structured Sparsity. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2022.

25. Bello K.*[G], Ke C.[G], Honorio J. A Thorough View of Exact Inference in Graphs from the Degree-4 SoS Hierarchy. In *Artificial Intelligence and Statistics (AIStats)*, 2022. **(29.2% acceptance ratio for full papers).**

26. Ke C.*[G], Honorio J. Federated Myopic Community Detection with One-shot Communication. In *Artificial Intelligence and Statistics (AIStats)*, 2022. **(29.2% acceptance ratio for full papers).**

27. Barik A.*[G], Honorio J. Fair Sparse Regression with Clustering: An Invex Relaxation for a Combinatorial Problem. In *Neural Information Processing Systems (NeurIPS)*, 2021. **(3% acceptance ratio for spotlight presentations, 26% acceptance ratio for full papers).**

28. Dexter G.*[G], Bello K.[G], Honorio J. Inverse Reinforcement Learning in a Continuous Space with Formal Guarantees. In *Neural Information Processing Systems (NeurIPS)*, 2021. **(26% acceptance ratio for full papers).**

29. Komanduru A.*[G], Honorio J. A Lower Bound for the Sample Complexity of Inverse Reinforcement Learning. In *International Conference on Machine Learning (ICML)*, 2021. **(21.5% acceptance ratio for full papers).**

30. Zhang Q.*[G], Zheng Y.[G], Honorio J. Meta Learning for Support Recovery in High-dimensional Precision Matrix Estimation. In *International Conference on Machine Learning (ICML)*, 2021. **(21.5% acceptance ratio for full papers).**

31. Bello K.*[G], Xu Q.[G], Honorio J. A Le Cam Type Bound for Adversarial Learning and Applications. In *IEEE International Symposium on Information Theory (ISIT)*, 2021.

32. Liang J.*[G], Ke C.[G], Honorio J. Information Theoretic Limits of Exact Recovery in Sub-hypergraph Models for Community Detection. In *IEEE International Symposium on Information Theory (ISIT)*, 2021.

33. Adams D.*^{U}, Barik A.^{G}, Honorio J. Information-Theoretic Bounds for Integral Estimation. In *IEEE International Symposium on Information Theory (ISIT)*, 2021.

34. Kesari K.*^{G}, Honorio J. First Order Methods take Exponential Time to Converge to Global Minimizers of Non-Convex Functions. In *IEEE International Symposium on Information Theory (ISIT)*, 2021.

35. Alabdulkareem A.*^{U}, Honorio J. Information-Theoretic Lower Bounds for Zero-Order Stochastic Gradient Estimation. In *IEEE International Symposium on Information Theory (ISIT)*, 2021.

36. Li Z.*^{G}, Honorio J. Regularized Loss Minimizers with Local Data Perturbation: Consistency and Data Irrecoverability. In *IEEE International Symposium on Information Theory (ISIT)*, 2021.

37. Wang Z.*^{G}, Honorio J. The Sample Complexity of Meta Sparse Regression. In *Artificial Intelligence and Statistics (AIStats)*, 2021. **(29.8% acceptance ratio for full papers).**

38. Ohnishi Y.*^{G}, Honorio J. Novel Change of Measure Inequalities with Applications to PAC-Bayesian Bounds and Monte Carlo Estimation. In *Artificial Intelligence and Statistics (AIStats)*, 2021. **(29.8% acceptance ratio for full papers).**

39. Widmoser M.*, Pacheco M., Honorio J., Goldwasser D. Randomized Deep Structured Prediction for Discourse-Level Processing. In *European Association for Computational Linguistics (EACL)*, 2021.

40. Zhang Z.*, Wang T., Honorio J., Li N., Backes M., He S., Chen J. Zhang Y. PrivSyn: Differentially Private Data Synthesis. In *USENIX Security Symposium*, 2021.

41. Bello K.*^{G}, Honorio J. Fairness Constraints can Help Exact Inference in Structured Prediction. In *Neural Information Processing Systems (NeurIPS)*, 2020. **(20.1% acceptance ratio for full papers).**

42. Bello K.*^{G}, Ghoshal A. Honorio J. Minimax Bounds for Structured Prediction Based on Factor Graphs. In *Artificial Intelligence and Statistics (AIStats)*, 2020. **(32.4% acceptance ratio for full papers).**

43. Barik A.*^{G}, Honorio J. Provable Efficient Skeleton Learning of Encodable Discrete Bayes Nets in Poly-Time and Sample Complexity. In *IEEE International Symposium on Information Theory (ISIT)*, 2020.

44. Bello K.*^{G}, Honorio J. Exact Inference in Structured Prediction. In *Neural Information Processing Systems (NeurIPS)*, 2019. **(21.2% acceptance ratio for full papers).**

45. Barik A.*^{G}, Honorio J. Learning Bayesian Networks with Low Rank Conditional Probability Tables. In *Neural Information Processing Systems (NeurIPS)*, 2019. **(21.2% acceptance ratio for full papers).**

46. Komanduru A.*^{G}, Honorio J. On the Correctness and Sample Complexity of Inverse Reinforcement Learning. In *Neural Information Processing Systems (NeurIPS)*, 2019. **(21.2% acceptance ratio for full papers).**

47. Meyer R.*^{U}, Honorio J. Optimality Implies Kernel Sum Classifiers are Statistically Efficient. In *International Conference on Machine Learning (ICML)*, 2019. **(22.6% acceptance ratio for full papers).**

48. Guo Y.*^{G}, Honorio J., Morgan J. Cost-Aware Learning for Improved Identifiability with Multiple Experiments. In *IEEE International Symposium on Information Theory (ISIT)*, 2019.

49. Wang Z.*^{G}, Honorio J. Reconstructing a Bounded-Degree Directed Tree Using Path Queries. In *IEEE Allerton Conference on Communication, Control and Computing*, 2019.

50. Bello K.*^{G}, Honorio J. Learning Latent Variable Structured Prediction Models with Gaussian Perturbations. In *Neural Information Processing Systems (NeurIPS)*, 2018. **(20.8% acceptance ratio for full papers).**

51. Bello K.*^{G}, Honorio J. Computationally and Statistically Efficient Learning of Causal Bayes Nets Using Path Queries. In *Neural Information Processing Systems (NeurIPS)*, 2018. **(20.8% acceptance ratio for full papers).**

52. Ke C.*[G], Honorio J. Information-theoretic Limits for Community Detection in Network Models. In *Neural Information Processing Systems (NeurIPS)*, 2018. **(20.8% acceptance ratio for full papers).**

53. Liu M.*[G], Honorio J., Cheng G. Statistically and Computationally Efficient Variance Estimator for Kernel Ridge Regression. In *IEEE Allerton Conference on Communication, Control and Computing*, 2018.

54. Ghoshal A.*[G], Honorio J. Learning Maximum-A-Posteriori Perturbation Models for Structured Prediction in Polynomial Time. In *International Conference on Machine Learning (ICML)*, 2018. **(long talk, 8.6% acceptance ratio for presentations, 25.1% acceptance ratio for full papers).**

55. Ghoshal A.*[G], Honorio J. Learning Linear Structural Equation Models in Polynomial Time and Sample Complexity. In *Artificial Intelligence and Statistics (AIStats)*, 2018. **(long talk, 4.8% acceptance ratio for presentations, 33.2% acceptance ratio for full papers).**

56. Ghoshal A.*[G], Honorio J. Learning Sparse Polymatrix Games in Polynomial Time and Sample Complexity. In *Artificial Intelligence and Statistics (AIStats)*, 2018. **(33.2% acceptance ratio for full papers).**

57. Xu Y.*[G], Honorio J., Wang X. On the Statistical Efficiency of Compositional Nonparametric Prediction. In *Artificial Intelligence and Statistics (AIStats)*, 2018. **(33.2% acceptance ratio for full papers).**

58. Ghoshal A.*[G], Honorio J. Learning Identifiable Gaussian Bayesian Networks in Polynomial Time and Sample Complexity. In *Neural Information Processing Systems (NeurIPS)*, 2017. **(20.9% acceptance ratio for full papers).**

59. Honorio J.* On the Sample Complexity of Learning Graphical Games. In *IEEE Allerton Conference on Communication, Control and Computing*, 2017.

60. Barik A.*[G], Honorio J., Tawarmalani M. Information-Theoretic Limits for Linear Prediction with Graph-Structured Sparsity. In *IEEE International Symposium on Information Theory (ISIT)*, 2017.

61. Ghoshal A.*[G], Honorio J. Information-Theoretic Limits of Bayesian Network Structure Learning. In *Artificial Intelligence and Statistics (AIStats)*, 2017. **(31.7% acceptance ratio for full papers).**

62. Ghoshal A.*[G], Honorio J. Learning Graphical Games from Behavioral Data: Sufficient and Necessary Conditions. In *Artificial Intelligence and Statistics (AIStats)*, 2017. **(31.7% acceptance ratio for full papers).**

63. Ghoshal A.*[G], Honorio J. From Behavior to Sparse Graphical Games: Efficient Recovery of Equilibria. In *IEEE Allerton Conference on Communication, Control and Computing*, 2016.

64. Honorio J.*, Jaakkola T. Structured Prediction: From Gaussian Perturbations to Linear-Time Principled Algorithms. In *Uncertainty in Artificial Intelligence (UAI)*, 2016. **(long talk, 9.2% acceptance ratio for presentations, 31% acceptance ratio for full papers).**

65. Park K.*[G], Honorio J. Information-Theoretic Lower Bounds for Recovery of Diffusion Network Structures. In *IEEE International Symposium on Information Theory (ISIT)*, 2016.

66. Honorio J.*, Jaakkola T. A Unified Framework for Consistency of Regularized Loss Minimizers. In *International Conference on Machine Learning (ICML)*, 2014. **(long talk, 25% acceptance ratio for full papers).**

67. Honorio J.*, Jaakkola T. Tight Bounds for the Expected Risk of Linear Classifiers and PAC-Bayes Finite-Sample Guarantees. In *Artificial Intelligence and Statistics (AIStats)*, 2014. **(35.8% acceptance ratio for full papers).**

68. Honorio J.*, Jaakkola T. Inverse Covariance Estimation for High-Dimensional Data in Linear Time and Space: Spectral Methods for Riccati and Sparse Models. In *Uncertainty in Artificial Intelligence (UAI)*, 2013. **(31.3% acceptance ratio for full papers).**

69. Honorio J.*, Jaakkola T. Two-Sided Exponential Concentration Bounds for Bayes Error Rate and Shannon Entropy. In *International Conference on Machine Learning (ICML)*, 2013. **(23.5% acceptance ratio for full papers).**

70. Gkirtzou K.*, Honorio J., Samaras D., Goldstein R., Blaschko M. fMRI Analysis of Cocaine Addiction Using k-Support Sparsity. In *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2013.

71. Honorio J.* Convergence Rates of Biased Stochastic Optimization for Learning Sparse Ising Models. In *International Conference on Machine Learning (ICML)*, 2012. **(long talk, 27.3% acceptance ratio for full papers).**

72. Honorio J.*, Samaras D., Rish I., Cecchi G. Variable Selection for Gaussian Graphical Models. In *Artificial Intelligence and Statistics (AIStats)*, 2012. **(30% acceptance ratio for full papers).**

73. Honorio J.* Lipschitz Parametrization of Probabilistic Graphical Models. In *Uncertainty in Artificial Intelligence (UAI)*, 2011. **(33.7% acceptance ratio for full papers).**

74. Honorio J.*, Samaras D. Multi-Task Learning of Gaussian Graphical Models. In *International Conference on Machine Learning (ICML)*, 2010. **(long talk, 25.6% acceptance ratio for full papers).**

75. Honorio J.*, Samaras D., Tomasi D., Goldstein R. Simple Fully Automated Group Classification on Brain fMRI. In *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2010.

76. Honorio J.*, Ortiz L., Samaras D., Paragios N., Goldstein R. Sparse and Locally Constant Gaussian Graphical Models. In *Neural Information Processing Systems (NeurIPS)*, 2009. **(23.8% acceptance ratio for full papers).**

77. Langs G.*, Samaras D., Paragios N., Honorio J., Alia-Klein N., Tomasi D., Volkow N., Goldstein R. Task-Specific Functional Brain Geometry from Model Maps. In *Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, 2008. **(35% acceptance ratio for full papers).**

Journal Publications (Computer Science)

78. Maurya D.*^{G}, Honorio J. A Theoretical Study of the Effects of Adversarial Attacks on Sparse Regression. *Transactions on Machine Learning Research (TMLR)*, 2024.

79. Li W., Li H., Song Q., Honorio J. PyXAB - A Python Library for $\mathcal{X}$-Armed Bandit and Online Blackbox Optimization Algorithms. *Journal of Open Source Software (JOSS)*, 2024. **(Impact factor: 4.6)**

80. Xie H.*^{G}, Honorio J. Meta Learning for High-dimensional Ising Model Selection Using ℓ_1-regularized Logistic Regression. *Transactions on Machine Learning Research (TMLR)*, 2024.

81. Bai S.*^{G}, Ke C., Honorio J. On the Dual Problem of Convexified Convolutional Neural Networks. *Transactions on Machine Learning Research (TMLR)*, 2024.

82. Ke C.*, Honorio J. Provable Guarantees for Sparsity Recovery with Deterministic Missing Data Patterns. *Transactions on Machine Learning Research (TMLR)*, 2024.

83. Barik A.*, Honorio J. Recovering Exact Support in Federated lasso without Optimization. *Transactions on Machine Learning Research (TMLR)*, 2024.

84. Ke C.*^{G}, Honorio J. Exact Partitioning of High-order Models with a Novel Convex Tensor Cone Relaxation. *Journal of Machine Learning Research (JMLR)*, 23(284): pp. 1-28, 2022. **(Impact factor: 3.4)**

85. Honorio J.*, Ortiz L. Learning the Structure and Parameters of Large-Population Graphical Games from Behavioral Data. *Journal of Machine Learning Research (JMLR)*, 16(Jun): pp. 1157-1210, 2015. **(Impact factor: 3.4)**

86. Belilovsky E.*, Gkirtzou K., Misyrlis M., Konova A., Honorio J., Alia-Klein N., Goldstein R., Samaras D., Blaschko M. Predictive Sparse Modeling of fMRI Data for Improved Classification, Regression, and Visualization Using the k-Support Norm. *Computerized Medical Imaging and Graphics*, 46(1): pp. 40-46, 2015. **(Impact factor: 1.7)**

87. Honorio J.*, Tomasi D., Goldstein R., Leung H.C., Samaras D. Can a Single Brain Region Predict a Disorder?. *IEEE Transactions on Medical Imaging*, 31(11), 2012. **(Impact factor: 4.7)**

88. Kirmizibayrak C.*, Honorio J., Jiang X., Mark R., Hahn J. Digital Analysis and Visualization of Swimming Motion. *The International Journal of Virtual Reality*, 10(3), 2011. **(Impact factor: 0.8)**

Journal Publications (Neuroscience)

89. Moeller S.*, Honorio J., Tomasi D., Parvaz M., Woicik P., Volkow N., Goldstein R. Methylphenidate Enhances Executive Function and Optimizes Prefrontal Function in Both Health and Cocaine Addiction. *Cerebral Cortex*, 24(3): pp. 643-653, 2014. **(Impact factor: 8.3)**

90. Moeller S.*, Tomasi D., Honorio J., Volkow N., Goldstein R. Dopaminergic Involvement During Mental Fatigue in Health and Cocaine Addiction. *Translational Psychiatry*, 2: e176, 2012. **(Impact factor: 5.6)**

91. Moeller S.*, Tomasi D., Woicik P., Maloney T., Alia-Klein N., Honorio J., Telang F., Wang G., Wang R., Sinha R., Carise D., Astone-Twerell J., Bolger J., Volkow N., Goldstein R. Enhanced Midbrain Response at 6-month Follow-up in Cocaine Addiction, Association with Reduced Drug-related Choice. *Addiction Biology*, 17(6): pp. 1013-25, 2012. **(Impact factor: 5.9)**

92. Tomasi D.*, Volkow N., Wang R., Honorio J., Maloney T., Alia-Klein N., Woicik P., Telang F., Goldstein R. Disrupted Functional Connectivity with Dopaminergic Midbrain in Cocaine Abusers. *Public Library of Science (PLoS ONE)*, 2010. **(Impact factor: 3.2)**

93. Goldstein R.*, Woicik P., Maloney T., Tomasi D., Alia-Klein N., Shan J., Honorio J., Samaras D., Ruiliang W., Telang F., Wang G., Volkow N. Oral Methylphenidate Normalizes Cingulate Activity in Cocaine Addiction During a Salient Cognitive Task. *Proceedings of the National Academy of Sciences*, 107(38), 2010. **(Impact factor: 9.4)**

94. Goldstein R.*, Tomasi D., Alia-Klein N., Honorio J., Maloney T., Woicik P., Wang R., Telang F., Volkow N. Dopaminergic response to drug words in cocaine addiction. *Journal of Neuroscience*, 29(18), 2009. **(Impact factor: 6.3)**

95. Goldstein R.*, Alia-Klein N., Tomasi D., Honorio J., Maloney T., Woicik P., Wang R., Telang F., Volkow N. Anterior cingulate cortex hypoactivation to an emotionally salient task in cocaine addiction: brain-behavior dissociation. *Proceedings of the National Academy of Sciences*, 106(23), 2009. **(Impact factor: 9.4)**

Refereed Workshops and Non-Refereed Conferences

96. Honorio J., Chen C.*, Gao G., Du K., Jaakkola T. Full paper: Integration of PCA with a Novel Machine Learning Method for Reparameterization and Assisted History Matching Geologically Complex Reservoirs. In *Society of Petroleum Engineers: 91th Annual Technical Conference and Exhibition*, 2015.

97. Honorio J.*, Samaras D., Rish I., Cecchi G. Abstract: Improving Interpretability of Graphical Models in fMRI Analysis via Variable-Selection. In *Organization for Human Brain Mapping, Annual Meeting.* Hamburg/Germany, 2014.

98. Misyrlis M.*, Konova A., Blaschko M., Honorio J., Alia-Klein N., Goldstein R., Samaras D. Full paper: Predicting Cross-task Behavioral Variables from fMRI Data Using the k-Support Norm. In *Medical Image Computing and Computer-Assisted Intervention (MICCAI), Workshop on Sparsity Techniques in Medical Imaging.* Boston, 2014.

99. Chen C.*, Gao G., Honorio J., Gelderblom P., Jimenez E., Jaakkola T. Full paper: Integration of PCA and Streamline Information for the History Matching of Channelized Reservoirs. In *Society of Petroleum Engineers: 90th Annual Technical Conference and Exhibition*, 2014.

100. Gkirtzou K.*, Honorio J., Samaras D., Goldstein R., Blaschko M. Full paper: fMRI Analysis with Sparse Weisfeiler-Lehman Graph Statistics. In *Medical Image Computing and Computer-Assisted Intervention (MICCAI), Workshop on Machine Learning in Medical Imaging.* Nagoya/Japan, 2013.

101. Yun K.*, Honorio J., Chattopadhyay D., Berg T., Samaras D. Full paper: Two-person Interaction Detection Using Body-Pose Features and Multiple Instance Learning. In *IEEE Computer Vision and Pattern Recognition (CVPR), Workshop on Human Activity Understanding from 3D Data*. Rhode Island, 2012.

102. Kirmizibayrak C.*, Honorio J., Jiang X., Mark R., Hahn J. Full paper: Digital Analysis and Visualization of Swimming Motion. In *Computer Animation and Social Agents (CASA), Simulation of Sports Motion Workshop*. Chengdu/China, 2011.

103. Moeller S.*, Tomasi D., Honorio J., Volkow N., Goldstein R. Abstract: Dopaminergic contribution to endogenous motivation during cognitive control breakdown. In *Society for Neuroscience*, 2011.

104. Honorio J.*, Ortiz L., Samaras D., Goldstein R. Short paper: Learning Brain fMRI Structure Through Sparseness and Local Constancy. In *Neural Information Processing Systems (NeurIPS), Workshop on Connectivity Inference in NeuroImaging*. Whistler/Canada, 2009.

105. Langs G.*, Samaras D., Paragios N., Honorio J., Golland P., Alia-Klein N., Tomasi D., Volkow N., Goldstein R. Short paper: A Functional Geometry of fMRI BOLD Signal Interactions. In *Neural Information Processing Systems (NeurIPS), Workshop on Connectivity Inference in NeuroImaging*. Whistler/Canada, 2009.

Invited Book Chapters

106. Honorio J.*, Samaras D., Rish I., Cecchi G. Variable Selection in Gaussian Markov Random Fields (Chapter 2, pp. 45–64). In "Log-Linear Models, Extensions and Applications," MIT Press, November 2018, ISBN: 978-026-2039-50-5.
https://mitpress.mit.edu/books/log-linear-models-extensions-and-applications

107. Honorio J.* Classification on Brain Functional Magnetic Resonance Imaging: Dimensionality, Sample Size, Subject Variability and Noise (Chapter 8, pp. 153–163). In "Frontiers of Medical Imaging," World Scientific, November 2014, ISBN: 978-981-4611-09-1.
https://www.worldscientific.com/doi/abs/10.1142/9789814611107_0008

Technical Reports

108. Yang X.*^{G}, Honorio J., "Information Theoretic Sample Complexity Lower Bound for Feed-Forward Fully-Connected Deep Networks," Technical report, available at Arxiv, Purdue University, 2020.

109. Li Y.*^{G}, Honorio J., "The Error Probability of Random Fourier Features is Dimensionality Independent," Technical report, available at Arxiv, Purdue University, 2018.

110. Honorio J.*, Jaakkola T., Samaras D., "On the Statistical Efficiency of $\ell_{1,p}$ Multi-Task Learning of Gaussian Graphical Models," Technical report, available at Arxiv, Purdue University, 2015.

4 Funding

- "Collaborative Research: Robust Deep Learning in Real Physical Space: Generalization, Scalability, and Credibility", (1 student, 3 years) US$ 800,000.
  PI: Lin G., Co-PIs: Honorio J., Chan S., Cheng G., Ma Y.
  Award number: 2134209, NSF SCALE MoDL.
  Period of support: September 1, 2021 to August 31, 2024. Products:
  - Barik A.*, Honorio J. Fair Sparse Regression with Clustering: An Invex Relaxation for a Combinatorial Problem. In *Neural Information Processing Systems (NeurIPS)*, 2021. **(3% acceptance ratio for spotlight presentations, 26% acceptance ratio for full papers).**
  - Ke C.*, Honorio J. Exact Partitioning of High-order Planted Models with a Tensor Nuclear Norm Constraint. In *IEEE International Conference on Acoustics, Speech & Signal Processing (ICASSP)*, 2022.
  - Ke C.*, Honorio J. Exact Partitioning of High-order Models with a Novel Convex Tensor Cone Relaxation. *Journal of Machine Learning Research (JMLR)*, 23(284): pp. 1-28, 2022. (Impact factor: 3.4)

  - Barik A.*, Honorio J. Sparse Mixed Linear Regression with Guarantees: Taming an Intractable Problem with Invex Relaxation. In *International Conference on Machine Learning (ICML)*, 2022. **(19.8% acceptance ratio for full papers).**
  - Lee H.*, Song Q., Honorio J. Support Recovery in Sparse PCA with Incomplete Data. In *Neural Information Processing Systems (NeurIPS)*, 2022. **(25.6% acceptance ratio for full papers).**
  - Xu Q.*^{G}, Tao G., Honorio J., Liu Y., An S., Shen G., Cheng S., Zhang X. Remove Model Backdoors via Importance Driven Cloning. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023. **(25.8% acceptance ratio for full papers).**
  - Ke C.*^{G}, Honorio J. Exact Inference in High-order Structured Prediction. In *International Conference on Machine Learning (ICML)*, 2023. **(27.9% acceptance ratio for full papers).**
  - Li W.*^{G}, Song Q., Honorio J., Lin G. Federated $\mathcal{X}$-Armed Bandit. In *Association for the Advancement of Artificial Intelligence Conference (AAAI)*, 2024. **(23.8% acceptance ratio for full papers).**
  - Li W.*^{G}, Honorio J., Song Q. Personalized Federated $\mathcal{X}$-Armed Bandit. In *Artificial Intelligence and Statistics (AIStats)*, 2024. **(27.6% acceptance ratio for full papers).**

- "RI: Small: Efficient Learning and Inference with Perturbations", (2 students, 2 years) US$ 272,979.
  PI: Honorio J.
  Award number: 1716609, NSF IIS Core Programs.
  Period of support: September 1, 2017 to August 31, 2020. Products:
  - Ghoshal A.*, Honorio J. Learning Maximum-A-Posteriori Perturbation Models for Structured Prediction in Polynomial Time. In *International Conference on Machine Learning (ICML)*, 2018. **(8.6% acceptance ratio for presentations, 25.1% acceptance ratio for full papers).**
  - Bello K.*, Honorio J. Learning Latent Variable Structured Prediction Models with Gaussian Perturbations. In *Neural Information Processing Systems (NeurIPS)*, 2018. **(20.8% acceptance ratio for full papers).**
  - Bello K.*, Honorio J. Fairness Constraints can Help Exact Inference in Structured Prediction. In *Neural Information Processing Systems (NeurIPS)*, 2020. **(20.1% acceptance ratio for full papers).**
  - Bello K.*, Ghoshal A. Honorio J. Minimax Bounds for Structured Prediction Based on Factor Graphs. In *Artificial Intelligence and Statistics (AIStats)*, 2020. **(32.4% acceptance ratio for full papers).**
  - Bello K.*, Honorio J. Fairness Constraints can Help Exact Inference in Structured Prediction. In *Neural Information Processing Systems (NeurIPS)*, 2020. **(20.1% acceptance ratio for full papers).**
  - Bello K.*, Ke C., Honorio J. A Thorough View of Exact Inference in Graphs from the Degree-4 SoS Hierarchy. In *Artificial Intelligence and Statistics (AIStats)*, 2022. **(29.2% acceptance ratio for full papers).**
  - Ke C.*, Honorio J. Federated Myopic Community Detection with One-shot Communication. In *Artificial Intelligence and Statistics (AIStats)*, 2022. **(29.2% acceptance ratio for full papers).**

- "Theoretical Foundations of Social Networks", (1 student, 1 year) US$ 30,144.
  PI: Honorio J.
  Purdue Research Foundation (PRF).
  Period of support: June 1, 2018 to May 31, 2019. Products:
  - Ke C.*, Honorio J. Information-theoretic Limits for Community Detection in Network Models. In *Neural Information Processing Systems (NeurIPS)*, 2018. **(20.8% acceptance ratio for full papers).**

5 Invited Talks

- "Optimization in Combinatorial and Non-Convex ML: Positive and Negative Results". August 21, 2024, ARC Training Centre in Optimisation Technologies, Integrated Methodologies, and Applications, Australia.
- "Learning Causal Networks: Identifiability, Certifiable Correctness and Efficient Algorithms". June 11, 2024, The University of Melbourne, Australia. (Host: Christine Rizkallah).
- American Causal Inference Conference. **(Invited talk)** May 14-17, 2024, Seattle/Washington.
- "Computational and Statistical Foundations in Combinatorial and Non-Convex Machine Learning". May 13, 2024, University of Washington. (Hosts: Ali Shojaie and Armeen Taeb.)

- Computing and Information Systems Lightning Talk. March 27, 2024, The University of Melbourne, Australia.
- "Computational and Statistical Foundations in Combinatorial and Non-Convex Machine Learning".
  - December 8, 2023, Stony Brook University (SUNY Stony Brook), New York. (Host: Dimitris Samaras.)
  - December 1, 2023, Mount Sinai School of Medicine, New York. (Host: Rita Goldstein.)
  - May 3, 2023, Boston University, Massachusetts.
  - March 8, 2023, The University of Melbourne, Australia.
  - February 27, 2023, University at Buffalo (SUNY Buffalo), New York.
- "Computational and Statistical Foundations of Relaxations in Combinatorial Machine Learning".
  - October 12, 2022, National University of Singapore. (Host: Bryan Low.)
  - September 23, 2022, National University of Singapore. (Host: Arnab Bhattacharya.)
  - May 31, 2022, University of Oxford. (Host: Marta Kwiatkowska.)
  - March 11, 2022, National University of Singapore. (Host: Vincent Tan.)
- "Theoretical Foundations of Combinatorial Problems in Machine Learning".
  - October 21, 2021, Hebrew University of Jerusalem. (Host: Shai Shalev-Shwartz.)
  - October 1, 2021, Columbia University. (Host: Daniel Hsu.)
  - September 30, 2021, University of Massachusetts Amherst. (Host: Benjamin Marlin.)
  - September 8, 2021, University College London. (Host: John Shawe-Taylor.)
  - June 14, 2021, California Institute of Technology. (Host: Anima Anandkumar.)
  - April 2, 2021, Carnegie Mellon University. (Host: Pradeep Ravikumar.)
  - March 31, 2021, University of Wisconsin-Madison. (Host: Robert Nowak.)
  - March 29, 2021, University of California-San Diego. (Host: Sanjoy Dasgupta.)
  - March 26, 2021, Massachusetts Institute of Technology. (Host: Devavrat Shah.)
  - February 4, 2021, Virginia Tech. (Host: Leah Johnson.)
  - February 3, 2021, Alan Turing Institute, United Kingdom. (Host: Jeremias Knoblauch.)
- "Computationally and Statistically Efficient Algorithms". June 8, 2018, International Symposium on Statistics, Purdue University, Indiana.
- "Learning Graphical Games". January 29, 2018, Mathematical and Computational Cognitive Science Colloquium, Purdue University, Indiana.
- "Learning Sparse Graphical Games".
  - February 1, 2017, New York University. (Host: Richard Cole.)
  - January 31, 2017, Princeton University, New Jersey. (Host: Elad Hazan.)
  - January 30, 2017, Columbia University, New York. (Host: Xi Chen.)
  - December 2, 2016, Statistics Research Colloquium, Purdue University, Indiana.
- Workshop on Information Theoretic Methods in Science and Engineering. **(Invited talk)** September 21-23, 2016, Helsinki/Finland.
- Workshop on Pattern Recognition and Applied Artificial Intelligence. **(Keynote speaker)** December 15-16, 2015, Pontificia Universidad Catolica del Peru, Lima/Peru.
- "Structured Prediction: From Gaussian Perturbations to Linear-Time Principled Algorithms". September 16, 2015, Machine Learning and Applications Seminar, Purdue University, Indiana.
- "Learning Structure from Data: Applications, Algorithms, Statistical Efficiency and General Frameworks".
  - March 30, 2015, Stony Brook University (SUNY Stony Brook), New York.
  - March 27, 2015, Stevens Institute of Technology, New Jersey.
  - March 24, 2015, Rutgers University, New Jersey.
  - March 16, 2015, Vanderbilt University, Tennessee.
  - March 10, 2015, National University of Singapore.
  - March 3, 2015, University of Arizona.

  - February 26, 2015, Michigan State University.
  - February 19, 2015, Rice University, Texas.
  - February 2, 2015, Purdue University, Indiana.

- "Convergence Rates of Biased Stochastic Optimization for Learning Sparse Ising Models".
  - November 7, 2012, Princeton University, New Jersey. (Host: Robert Schapire.)
  - September 25, 2012, Columbia University, New York. (Host: Michael Collins.)

- "Simultaneous and Group-Sparse Multi-Task Learning of Gaussian Graphical Models". September 27, 2012, Rutgers, New Jersey. (Host: Vladimir Pavlovic.)

- Provost's Graduate Student Lecture Series: "Learning Gaussian Graphical Models with Domain Specific Priors". May 2, 2012, Stony Brook University (SUNY Stony Brook), New York.

- "Lipschitz Parametrization of Probabilistic Graphical Models". July 14, 2011, Universidad Autonoma de Barcelona, Barcelona/Spain. (Host: Maria Vanrell.)

- "Simple Fully Automated Group Classification on Brain fMRI". April 23, 2010, Psychology Department, Stony Brook University (SUNY Stony Brook), New York. (Host: Hoi-Chung Leung.)

- "Classification and Structure Learning on Brain fMRI". March 29, 2010, IBM Watson Research Center, New York. (Host: Irina Rish.)

6 Professional Service

- Action Editor, Transactions on Machine Learning Research (TMLR), 2024 – present.
- Editorial Board Reviewer, Journal of Machine Learning Research (JMLR), 2020 – present. (Impact factor: 4.1)
- Area Chair, Neural Information Processing Systems (NeurIPS), 2021 – 2025.
- Area Chair, International Conference on Machine Learning (ICML), 2023 – 2025.
- Area Chair, Artificial Intelligence and Statistics (AIStats), 2025.
- Senior PC Member, Association for the Advancement of Artificial Intelligence Conference (AAAI), 2020, 2022, 2025.
- Senior PC Member, International Joint Conference on Artificial Intelligence (IJCAI), 2020, 2025.
- PC Member, Neural Information Processing Systems (NeurIPS), 2015 – 2020.
- PC Member, International Conference on Machine Learning (ICML), 2016 – 2022.
- PC Member, Artificial Intelligence and Statistics (AIStats), 2016 – 2024.
- PC Member, ACM International Conference on Knowledge Discovery and Data Mining (KDD), 2023.
- PC Member, IEEE Computer Vision and Pattern Recognition (CVPR), 2019.
- PC Member, International Conference on Computer Vision (ICCV), 2019.
- PC Member, Uncertainty in Artificial Intelligence (UAI), 2019.
- PC Member, Association for the Advancement of Artificial Intelligence Conference (AAAI), 2018.
- PC Member, ACM Conference on Information and Knowledge Management (CIKM), 2017.
- Reviewer, Journal of Machine Learning Research (JMLR), 2016 – 2020. (Impact factor: 4.1)
- Reviewer, IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), 2020. (Impact factor: 17.7)

- Reviewer, IEEE Transactions on Neural Networks and Learning Systems, 2021. (Impact factor: 8.8)
- Reviewer, Pattern Recognition (journal), 2021. (Impact factor: 7.2)
- Reviewer, Journal of the Royal Statistical Society: Series B, 2024. (Impact factor: 4.9)
- Reviewer, Journal of the American Statistical Association (JASA), 2020 – 2021, 2023 – 2024. (Impact factor: 4)
- Reviewer, IEEE Transactions on Information Theory, 2022, 2024. (Impact factor: 3.2)
- Reviewer, Public Library of Science (PLoS ONE), 2017, 2020. (Impact factor: 3.2)
- Reviewer, Bayesian Analysis, 2017. (Impact factor: 2.6)
- Reviewer, IEEE Transactions on Signal Processing, 2016 – 2017. (Impact factor: 2.6)
- Reviewer, Journal of Computational and Graphical Statistics, 2024. (Impact factor: 2.4)
- Reviewer, The Annals of Statistics, 2015 – 2016, 2019. (Impact factor: 2.3)
- Reviewer, Statistics and Computing (journal), 2015. (Impact factor: 1.8)
- Reviewer, Machine Learning (journal), 2017. (Impact factor: 1.7)
- Reviewer, Computational Statistics and Data Analysis (journal), 2021 – 2022. (Impact factor: 1.4)
- Reviewer, Electronic Journal of Statistics, 2024.
- Reviewer, Journal of Causal Inference, 2020.
- Reviewer, Physica A: Statistical Mechanics and its Applications (journal), 2020. (Impact factor: 2.5)
- Reviewer, Numerical Algorithms (journal), 2018. (Impact factor: 1.2)
- Reviewer, Symposium on Theoretical Aspects of Computer Science (STACS), 2020.
- Reviewer, IEEE International Symposium on Information Theory (ISIT), 2016.
- Workshop organizer, Algorithmic Game Theory and Data Science, ACM Conference on Economics and Computation (EC). Organizers: Honorio J., Nekipelov D., Paes Leme R., Singer Y., Syrgkanis V., Tamer E. June 26, 2017, Boston.

During PhD and Post-Doc

- Senior PC Member, International Joint Conference on Artificial Intelligence (IJCAI), 2015.
- PC Member, International Conference on Machine Learning (ICML), 2015.
- PC Member, Neural Information Processing Systems (NeurIPS), 2010.
- Reviewer, Journal of Machine Learning Research (JMLR), 2014. (Impact factor: 4.1)
- Reviewer, IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), 2011. (Impact factor: 17.7)
- Reviewer, Addiction Biology (journal), 2012. (Impact factor: 5.9)
- Reviewer, Brazilian Symposium on Computer Graphics and Image Processing (SIBGRAPI), 2007.

7 Teaching

- COMP 90049: Introduction to Machine Learning.
  Graduate level course, School of Computing and Information Systems, The University of Melbourne, Australia.
  - 2025 Semester 1.
- COMP 90051: Statistical Machine Learning.
  Graduate level course, School of Computing and Information Systems, The University of Melbourne, Australia.
  - 2024 Semester 2.
- CS 592-HLT / STAT 598-HLT: Hands-On Learning Theory. (See first page for an explanation)
  Graduate level course, Computer Science Department, Purdue University, Indiana.
  - Fall 2021.
  - Fall 2020.
  - Fall 2019.
  - Fall 2018.
  - Fall 2017.
  - Fall 2016.
  - Fall 2015.
- CS 690: Statistical Machine Learning II.
  Graduate level course, Computer Science Department, Purdue University, Indiana.
  - Fall 2021.
  - Spring 2019.
  - Spring 2017.
- CS 578: Statistical Machine Learning.
  Graduate level course, Computer Science Department, Purdue University, Indiana.
  - Fall 2020.
  - Spring 2020.
  - Spring 2018.
  - Fall 2017.
  - Fall 2016.
- CS 490-DSC: Data Science Capstone.
  Undegraduate level course, Computer Science Department, Purdue University, Indiana.
  - Spring 2022.
- CS 373: Data Mining and Machine Learning.
  Undegraduate level course, Computer Science Department, Purdue University, Indiana.
  - Spring 2021.
  - Fall 2019.
  - Fall 2018.
- CS 520: Computational Methods In Optimization.
  Graduate level course, Computer Science Department, Purdue University, Indiana.
  - Spring 2016.